



## RAMS

### 3321UL, 3322UL, 3331UL, 3332



**3321UL, 3322UL, & 3331UL rams comply with NFPA-1936,  
standard on powered rescue tool systems.**

All rights reserved. You are prohibited from copying or reproducing this manual, any materials contained herein or any portion hereof in any manner whatsoever without the express prior written consent of Holmatro.

Holmatro reserves the right to change the contents of this manual at any time without prior notice. Holmatro also reserves the right to change any part or component of any machine referenced in this manual at any time without prior notice.

This manual is intended for use solely with the basic version of each piece of equipment and each product referenced and should not be used in connection with any modified, altered or adapted version of any piece of equipment without the express prior written consent of Holmatro.

Additional information on adjustments, maintenance and repair of any product contained herein will be provided upon written request of the technical department of your supplier. If not provided, contact Holmatro directly.

**EXCEPT AS EXPRESSLY SET FORTH ON THE ENCLOSED WARRANTY CARD, HOLMATRO MAKES NO OTHER WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE STATEMENTS CONTAINED HEREIN. HOLMATRO HEREBY EXCLUDES ANY AND ALL IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**IN NO EVENT WILL HOLMATRO BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF USE OF THIS MANUAL OR ANY STATEMENTS CONTAINED THEREIN.**

**SOME STATES DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES OR LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

**IF ANY PROVISION CONTAINED HEREIN SHALL BE UNLAWFUL, VOID OR FOR ANY REASON UNENFORCEABLE, THEN THAT PROVISION SHALL BE SEVERED FROM THE STATEMENT AND SHALL NOT EFFECT THE VALIDITY AND ENFORCEABILITY OF THE REMAINING STATEMENTS CONTAINED HEREIN.**

## 1. Introduction

We congratulate you on this purchase. Be sure to read and understand this user manual before using the tool. This user manual covers the basic aspects for the safe use and operation of this equipment.

First of all check that your equipment is complete and undamaged. Notify your Holmatro dealer immediately if the equipment is damaged or incomplete, and do not use the equipment.

This equipment is designed for use by professional, fully trained fire and rescue personnel.

This is a double-acting hydraulic tool designed to be driven only by a Holmatro hydraulic pump. The entire system operates with mineral oil hydraulic fluid to an allowable pressure of 720 bar.

Follow these instructions to ensure your safety and to keep your equipment in good condition.

## 2. Safety Symbols



THIS IS THE SAFETY ALERT SYMBOL. IT IS USED TO ALERT YOU TO POTENTIAL PERSONAL INJURY HAZARDS. OBEY ALL SAFETY MESSAGES THAT FOLLOW THIS SYMBOL TO AVOID POSSIBLE INJURY OR DEATH.



DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage

### 3. Safety Instructions



Study these operating instructions carefully before operating this equipment.

- \* Use this equipment only for jobs for which it is designed. If in doubt or unsure, be sure to consult your dealer.
- \* Always wear personal protection equipment such as safety goggles, helmet, gloves, protective clothing and safety shoes.
- \* Keep spectators at sufficient distance.
- \* Stand on stable ground and use both hands to hold and/or operate the equipment.
- \* Hold the equipment only at the appropriate places, i.e. at the deadman's handle and the carrying handle.
- \* Stabilize the objects the tool will be used on.
- \* Ensure that the load is always applied to the centre of the cross heads and prevent angular loads.
- \* Allow only the cross heads of the ram to come into contact with the objects to be moved.
- \* Ensure that the dead-man's handle does not come in contact with firm objects. Stop in time!
- \* In the event of oil leakage, stop immediately and consult the troubleshooting list.
- \* In the event of unfamiliar noise, vibration or other unusual behaviour, stop immediately and consult your dealer.
- \* Never disconnect the quick-action couplings when the pump is in operation and when the pressure relief valve of the pump is in the "Operation" position.
- \* Store the ram with its piston(s) slightly projecting. To do this, first close the pistons completely, then open one section slightly.
- \* Use only original Holmatro accessories and parts.
- \* Observe the maintenance instructions.
- \* Only trained service technicians certified by Holmatro are allowed to repair this equipment.
- \* Replace safety symbols/pictograms and/or information labels if illegible.
- \* The safety valves between the couplers must never be adjusted. In the event that a problem develops with the safety valve, contact your dealer.
- \* This equipment must only be operated with non-toxic mineral base hydraulic oil distributed by Holmatro.

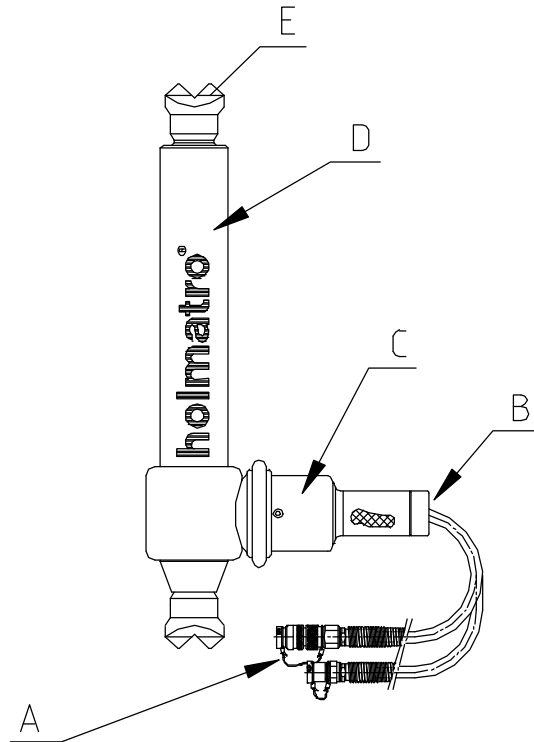
### 4 The tool is equipped with the following labels/stickers:

- Wear personal protection equipment
- Dead-man's handle operating direction
- Product identification: model, serial number, year of construction, etc.
- Warning: "Center the load"
- Warning: "Never work under/between the load".

## 5. Description: Model 3321-UL

### 5.1 Product identification.

- A. Quick-action couplings
- B. Safety relief valve
- C. Dead-man's handle
- D. Cylinder
- E. Cross heads



### 5.2 Specifications

#### Ram model: 3321-UL

Allowable operating pressure	:	10,500 psi	(720 bar)
Max. spreading force (NFPA-1936 HSF)	:	36,460 lbs	(162.2 kN)
Max. pulling force (NFPA-1936 HPF)	:	11,265 lbs	(50.1 kN)
Min. spreading force (NFPA-1936 LSF)	:	36,460 lbs	(162.2 kN)
Min. pulling force (NFPA-1936 LPF)	:	11,265 lbs	(50.1 kN)
Max. spreading travel	:	9 3/4"	(248 mm)
Weight, ready for use	:	29.75 lbs	(13.5 kg)
Closed Dimensions (LxWxH)	:	21 1/4" x 15 7/8" x 4 3/4"	(539x404x121)
Oil volume required for opening	:	34.2 cu in	(560 cc)
Oil volume required for closing	:	10 cu in	(163 cc)
Net required oil volume	:	24.2 cu in	(397 cc)
Temperature range	:	-4 F° to + 176° F	(-20 °C to +80 °C)

#### Opening and closing times (seconds) for rams 3321-UL.

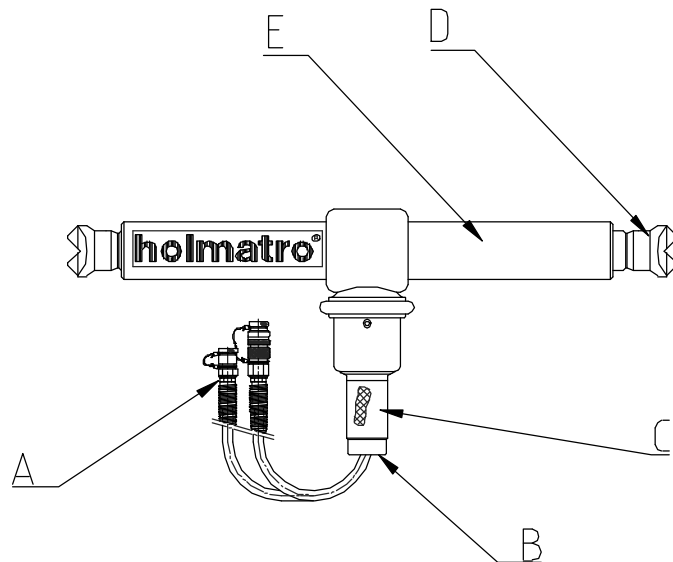
Open	2032	2035	2035	2035	2060	2060	2060	PPU15	DPU60	DPU60	DPU60
Close		GU	PU	EPA	B&S	Honda	GU		B&S	Honda	E
3321UL	27	16	15	15	14	12	14	13	16	16	16
	9	9	5	5	5	5	5	14	7	7	7

The times shown are for opening and closing under no load

## 6. Description: Model 3322-UL

### 6.1 Product identification.

- A. Quick-action couplings
- B. Safety relief valve
- C. Dead-man's handle
- D. Cross heads
- E. Cylinder



### 6.2 Specifications

#### Ram model: 3322-UL

Allowable operating pressure	:	10,500 psi	(720 bar)
Max. spreading force (NFPA-1936 HSF)	:	36,460 lbs	(162.2 kN)
Max. pulling force (NFPA-1936 HPF)	:	11,265 lbs	(50.1 kN)
Min. spreading force (NFPA-1936 LSF)	:	36,460 lbs	(162.2 kN)
Min. pulling force (NFPA-1936 LPF)	:	11,265 lbs	(50.1 kN)
Max. spreading travel	:	2 x 9 3/4"	(2 x 248 mm)
Weight, ready for use	:	39 lbs	(18 kg)
Closed Dimensions (LxWxH)	:	30 3/8" x 15 7/8" x 4 3/4"	(772x404x121)
Oil volume required for opening	:	68.4 cu in	(1121 cc)
Oil volume required for closing	:	22.1 cu in	(362 cc)
Net required oil volume	:	46.3 cu in	(759 cc)
Temperature range	:	-4 F° to + 176° F	(-20 °C to +80 °C)

#### Opening and closing times (seconds) for rams 3322-UL

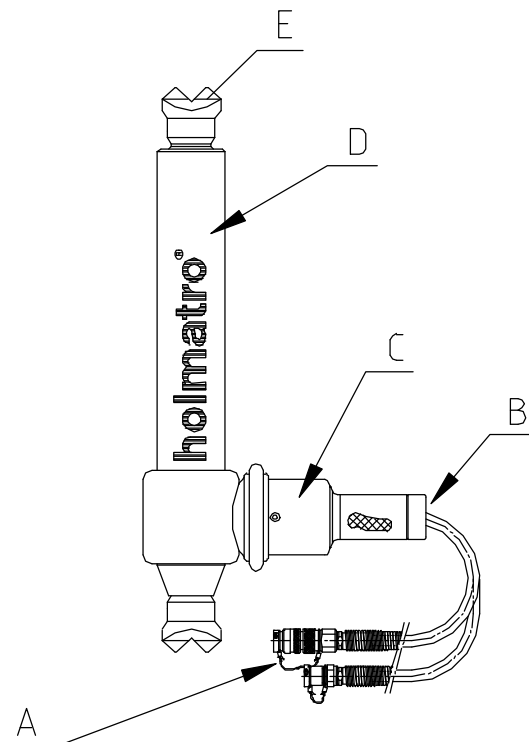
Open Close	2032	2035 GU	2035 PU	2035 EPA	2060 B&S	2060 Honda	2060 GU	PPU15	DPU60 B&S	DPU60 Honda	DPU60 E
	53 18	31 19	29 10	29 10	28 10	25 9	27 9	26 19	31 15	31 15	31 15

The times shown are for opening and closing under no load

## 7. Description: Model 3331-UL

### 7.1 Product identification.

- A. Quick-action couplings
- B. Safety relief valve
- C. Dead-man's handle
- D. Cylinder
- E. Cross heads



### 7.2 Specifications

#### Ram model: 3331-UL

Allowable operating pressure	:	10,500 psi	(720 bar)
Max. spreading force (NFPA-1936 HSF)	:	36,460 lbs	(162.2 kN)
Max. pulling force (NFPA-1936 HPF)	:	11,265 lbs	(50.1 kN)
Min. spreading force (NFPA-1936 LSF)	:	36,460 lbs	(162.2 kN)
Min. pulling force (NFPA-1936 LPF)	:	11,265 lbs	(50.1 kN)
Max. spreading travel	:	13 3/4"	(349 mm)
Weight, ready for use	:	34 lbs	(15.5 kg)
Closed Dimensions (LxWxH)	:	25 1/4 x 15 7/8 x 4 3/4	(642x404x121)
Oil volume required for opening	:	48 cu in	(785 cc)
Oil volume required for closing	:	13 cu in	(210 cc)
Net required oil volume	:	35 cu in	(575 cc)
Temperature range	:	-4 F° to + 176° F	(-20 °C to +80 °C)

#### Opening and closing times (seconds) for Model 3331-UL Ram

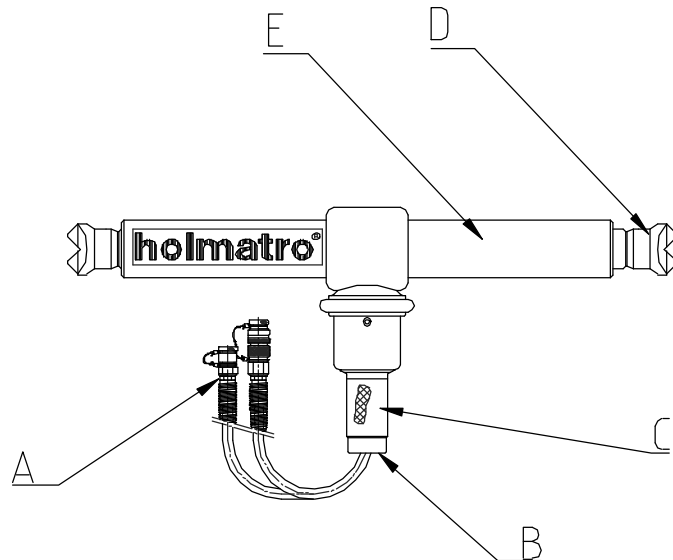
Open Close	2032	2035 GU	2035 PU	2035 EPA	2060 B&S	2060 Honda	2060 GU	PPU15	DPU60 B&S	DPU60 Honda	DPU60 E
3331	37 12	23 8	21 7	21 7	18 7	17.5 6.5	19 6.5	18 10	22 11	22 11	22 10

The times shown are for opening and closing under no load

## 8. Description: Model 3332

### 8.1 Product identification.

- A. Quick-action couplings
- B. Safety relief valve
- C. Dead-man's handle
- D. Cross heads
- E. Cylinder



### 8.2 Specifications

#### Ram model: 3332

Allowable operating pressure	:	10,500 psi	(720 bar)
Max. spreading force.	:	36,460 lbs	(162.2 kN)
Max. pulling force.	:	11,265 lbs	(50.1 kN)
Max. spreading travel	:	2 x 13 3/4"	(2 x 349 mm)
Weight, ready for use	:	45 lbs	(20.5 kg)
Closed Dimensions (LxWxH)	:	38 3/8 x 15 7/8 x 4 3/4"	(975 x 404 x 121 mm)
Oil volume required for opening	:	95.8 cu in	(1570 cc)
Oil volume required for closing	:	27.8 cu in	(456 cc)
Net required oil volume	:	68 cu in	(1114 cc)
Temperature range	:	-4 F° to + 176° F	(-20 °C to +80 °C)

#### Opening and closing times (seconds) for ram 3332

Open Close	2032	2035 GU	2035 PU	2035 EPA	2060 B&S	2060 Honda	2060 GU	PPU15	DPU60 B&S	DPU60 Honda	DPU60 E
3332	74	46	41	41	34.5	35	38	37	44	44	44
	24	16	14	14	14	13	13	22	22	22	20

The times shown are for opening and closing under no load



## 9. Operation

The oil from the hydraulic pump is supplied to the unit via high-pressure hoses. The oil returns at atmospheric pressure to the pump if the dead-man's handle is in the neutral position.



**Fig. 1. Control handle label.**

Oil is admitted under the piston if the dead-man's handle is in the “open” position. The ram piston(s) will extend. The oil above the piston flows back to the pump.

Oil is admitted above the piston if the dead-man's handle is in the “close” position. The ram piston(s) will retract. The oil under the piston flows back to the pump.

The dead-man's handle always returns to the neutral position when released.

The hydraulic system in the unit is provided with a safety valve. This safety valve prevents excessive pressure in the tool if the return line to the pump is blocked or disconnected. Never change the setting of this safety valve. Oil will discharge from the rear of the tool if the return hose becomes blocked or disconnected while the pump pressure relief valve is in “PRESSURE”/“OPERATION” position. If this happens, first switch the pump pressure relief valve to the “NEUTRAL” position, and then re-connect the return hose of the tool.

## 10. Use

### 10.1 Initial use (first time only)

- \* Check the equipment for damage. Do not use the equipment if it is not in good condition. Notify your dealer.
- \* Check whether the guarantee registration card has been supplied and filled in.
- \* Check whether the accessories are correctly mounted.

### 10.2 Preparation for use

- \* Check the operation of the dead-man's handle (return to neutral position).

## 10.2.1 Coupling

The unit is equipped with different quick-action couplings, i.e. "male" and "female".

### **CAUTION**

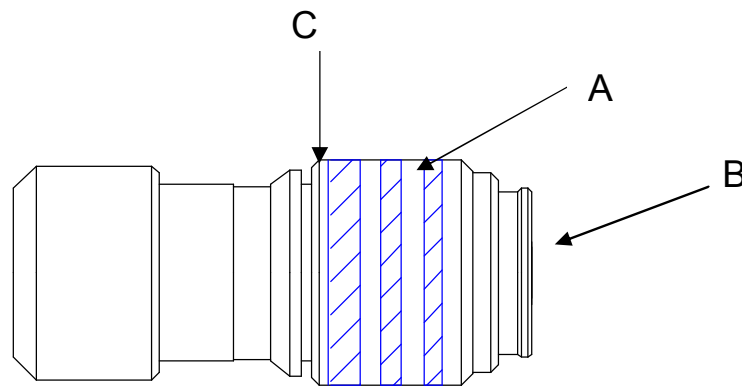
Never connect or disconnect the quick-action coupling when the pump relief valve is set to "PRESSURE"/"OPERATION". Set the pump relief valve to its "neutral" position before coupling or uncoupling hoses and/or tools.

To couple the hoses using the flat face coupler:

1. Remove the dust caps from both the male and female couplers.
2. Insert the male coupler into the female coupler and push.
3. The coupler's locking ring (A) will move forward to show the coupler is locked.
4. Check to make sure the connection is made by pulling on the two couplers.

To uncouple the hoses using the flat face coupler:

1. Turn the locking ring (A) of the coupler  $\frac{1}{4}$  turn counterclockwise when holding it in your hand pointing away from you (direction of large arrow on coupler) **and** pull back on the locking ring (direction of small arrow on coupler).



2. Remove the male coupler from the female coupler if it has not released completely.
3. Make sure you put the dust caps back onto the couplers when not in use. This is an important step to keep dirt and foreign objects from getting into the coupler.

Clean the female coupler by removing any dirt, oil, etc. with a clean dry rag. To ensure the automatic locking capability of the coupler, the coupler should be checked periodically and cleaned by following the simple steps below:

1. Rinse the coupler with lukewarm water and a soft soap solution.
2. When the coupling is dry and free from water, lubricate the flat end of the coupling (B) with Holmatro recommended hydraulic oil or by spraying WD-40 onto the end.
3. Lubricate the locking sleeve by spraying WD-40 carefully in the area (C) between the back part and the locking sleeve.
4. Connect the nipple into the coupling and see if the locking sleeve easily turns itself to the lock position. Check by pulling the locking sleeve straight back. The nipple should not disconnect.
5. To disconnect the nipple, turn the locking sleeve and pull it backward.
6. Repeat steps 4 and 5 a few times to assist internal lubrication of the locking sleeve.

### 10.2.2 Use

Turning the dead-man's handle clockwise has the same result in all Holmatro equipment (from January, 1995): the functional parts are opened. Turning counter-clockwise closes the functional parts. As soon as the dead-man's handle is released it automatically returns to its neutral position and the unit stops operating immediately.

### 10.2.3 Spreading:

The maximum and minimum spreading forces are measured in accordance with NFPA-1936, standard on powered rescue tools, 1999 edition. The maximum (HSF) and minimum (LSF) forces are equivalent at all points on the stroke of the plunger.

Turning the dead-man's handle clockwise extends the pistons and objects can be pushed apart. The pump automatically supplies the required pressure as soon as the crossheads experience any resistance.



Ensure that the original Holmatro accessories are attached correctly.



Prevent sharp protrusions from touching the piston during spreading. Damage leads to leakage through the seal.



Prevent the cross heads from sliding from the load. Use the optional ram support for weakened car bodies. Use only original Holmatro accessories and attach them correctly.

### 10.2.4 Pulling:

The maximum and minimum pulling forces are measured in accordance with NFPA-1936, standard on powered rescue tools, 1999 edition. The maximum (HPF) and minimum (LPF) forces are equivalent at all points on the stroke of the plunger. Pulling adapters and chains are available for pulling operations. (Any adapter not specifically designed for the ram models are unsafe and may cause serious injury.) Chains are equipped with shortening hooks. The strength of the chain set is at least two times that of the pulling force of the tool. When using the rams as a pulling device, no one other than the tool operator should be standing near the vehicle. Any accessories, i.e. chains or adapters used with the rams must be manufactured or supplied by Holmatro, or manufactured to meet the safety specifications and standards for such accessories.

Turning the dead-man's handle counter-clockwise retracts the pistons and objects can be pulled apart. The pump automatically supplies the required pressure as soon as the pulling attachments experience any resistance. A set of chains with hooks and chain adapters are available from Holmatro. The adapters are connected using the following procedure: to connect one of the chains to the object to be pulled, wrap the chain with the load hook around the object and hook it over the chain; connect the other chain to a suitable anchor point by wrapping the end with the load hook around the object and hooking the load hook over the chain. Remove the crossheads from the ram plungers. Fix the pulling adapters to the plungers by pulling up the adapter ring and inserting the plunger end into the slot. Push the ring down to prevent the adapter from coming off the plunger. Make sure the hooks point upwards. Now attach both chains and shortening hooks and pull the object. Make sure there are no by-standers near the pulling operation.

#### **CAUTION**

Ensure that the original Holmatro accessories are attached correctly.

#### **CAUTION**

Prevent sharp protrusions from touching the piston during pulling. Damage leads to leakage through the seal. Use only original Holmatro accessories and attach them correctly.

### 10.2.5 Shutting down

On completion of the work bring the pistons back into the cylinders. Check that the pump relief valve is in its "neutral" position before uncoupling. Remove any dirt from the couplings and the dust caps to prevent penetration into the hydraulic system. Take the dust caps apart and place them on the tool's couplings.

#### **CAUTION**

Never retract the pistons completely into the cylinders. When the retracting movement stops, spread the pistons again over a small distance of approx. 1/4 inch and store the unit in that condition.

### 10.2.6 Cleaning and storage

Clean the unit and any accessories used before storage.

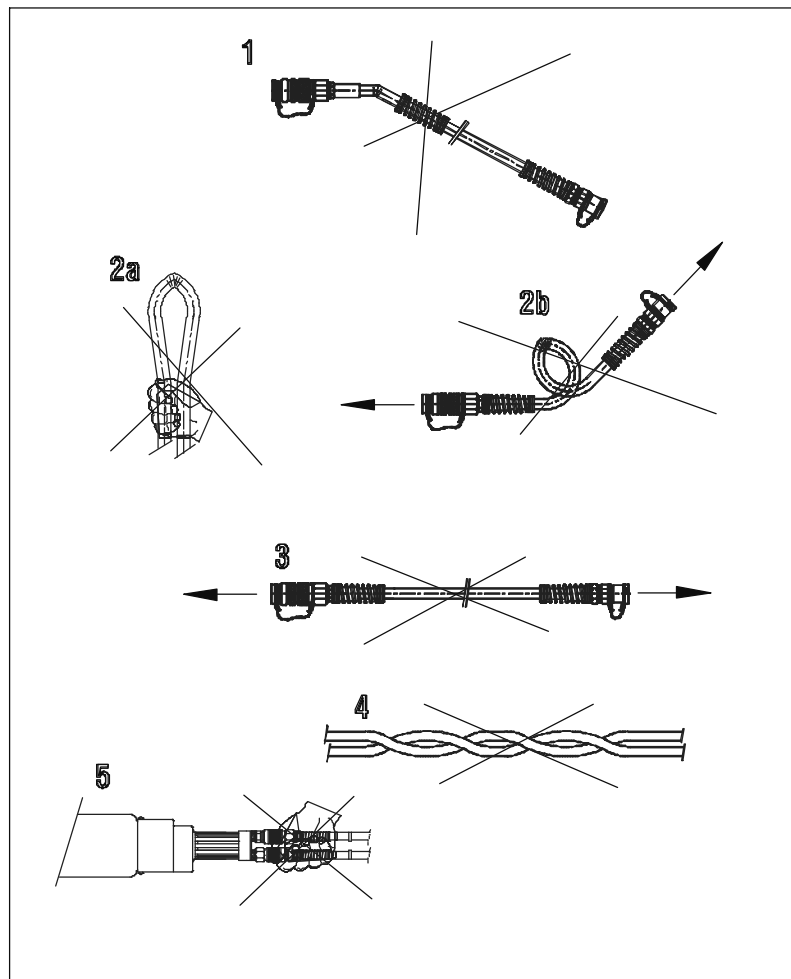
- \* Clean all quick-action couplings. Ensure that the dust caps are installed.
- \* Check the tool for external damage and/or oil leakage.
- \* Check the operation of the dead-man's handle.
- \* Dry the unit if it has been used in wet conditions. Lightly oil the steel parts.
- \* Clean the tool with a mild soap solution and dry thoroughly.

## 10.3 Important additional user information

### **WARNING**

The hydraulic hoses that make up the hydraulic system need attention. Observe the following points:

1. Do not use hoses without proper anti-kink devices and prevent kinking behind the attachment.
2. Prevent kinking of the hoses and never bend the hoses beyond their minimum bending radius (89 mm) (3 ½").
3. Do not pull the hoses to move tools or pumps.
4. Prevent twisting of the hose.
5. Do not use the hoses to keep the equipment in position and especially not if the hoses are pressurised.



## 11. Troubleshooting

### 11.1 The quick-action couplings cannot be connected or disconnected.

1	Check tool control handle position →	<i>Handle in open or close position</i> →	Release control handle to neutral position
---	--------------------------------------	---	--

↓ *Control handle in neutral*

2	Check for any pressure in the system →	<i>System pressurized</i> →	Release pressure at the pump
---	--	-----------------------------	------------------------------

↓ *Pressure relieved*

3	Check the coupling locking ring location →	<i>Incorrect position</i> →	Release locking ring
---	--	-----------------------------	----------------------

↓ *Locking ring released*

4	Consult your Dealer
---	---------------------

### 11.2 The connected equipment is not operating - or not properly.

1	Check the pump hydraulic oil level. →	<i>No or low hydraulic fluid</i> →	Add recommended hydraulic fluid up correct level.
---	---------------------------------------	------------------------------------	---

↓ *Hydraulic fluid level correct*

2	Check the connections (quick-action couplings). →	<i>Incorrect coupling.</i> →	Release pressure at pump by switching handle to the "NEUTRAL" position. Reconnect the couplings.
---	---	------------------------------	--

↓ *Couplings correct*

3	Check the position of the pump pressure relief valve. →	<i>Valve in "NEUTRAL". position.</i> →	Turn valve to "OPERATION" position.
---	---	--	-------------------------------------

↓ *Valve position okay*

4	Consult your Dealer
---	---------------------

### 11.3 Hydraulic oil is leaking from the tool safety valve.

1	Check quick-action couplings →	<i>Loose or disconnected couplings</i> →	Relieve the pressure at the pump and re-connect the couplings.
---	--------------------------------	--	--

↓ *Couplings okay*

2	Consult your Dealer
---	---------------------

### 11.4 The dead-man's handle is not operating properly.

1	Check control handle for external damage →	<i>Control handle damaged</i> →	Contact your Holmatro Dealer
---	--	---------------------------------	------------------------------

↓ *Control handle okay*

2	Check if the dead-man handle is stuck in any position. The control handle should move freely. →	<i>Dead-man handle stuck</i> →	Contact your Holmatro Dealer
---	---	--------------------------------	------------------------------

↓ *Dead-man handle okay.*

3	Consult your Holmatro Dealer
---	------------------------------

Consult your dealer in case of other problems or if the solutions provided above do not have the required results. In case of failure or repairs, always specify the model and serial number of the equipment to your dealer.

ALWAYS SHIP THE TOOL IN ITS ORIGINAL SHIPPING BOX.

## 12. Maintenance



Wear personal protection equipment during maintenance. Ensure that any spent replaced hydraulic oil is collected and disposed of in a responsible manner; think of the environment.

### 12.1 Regular maintenance (minimum every 3 months)

It is necessary to carry out regular maintenance. Increased use will necessitate more frequent maintenance intervals. Consult your dealer.

- \* Check whether the safety symbols and product identification labels are still present. If not, consult your dealer.
- \* Check the functions of the dead-man's handle.
- \* Check the accessories.
- \* Check the hoses, quick-action couplings and dust caps.
- \* Check the operation of the equipment.

### 12.2 Annual maintenance

With the proper care and correct preventive maintenance this unit will ensure many years of safe use. We recommend having the unit checked at least once a year by a trained technician with the proper knowledge and the necessary tools. Your dealer can carry out the annual maintenance on a contract basis on your behalf, if desired. This will ensure good and safe operation.

### 12.3 Five yearly maintenance and testing

We advise you to have the equipment checked and tested by your dealer or other body certified by Holmatro after a maximum of five years of use. Consult your dealer for further details.

### 12.4 Long-term storage

- \* Ensure that the equipment is completely depressurised.
- \* Store the equipment in a dry, well-ventilated area. Use additional preservatives on the external steel parts



## 13. Scrapping

The unit can be scrapped at the end of its service life and the various parts may be re-used. Collect the hydraulic oil and dispose of it separately. The unit consists of steel, aluminium, neoprene (seals) and plastic. The unit does not contain any pressurised components.

Also consult your dealer about scrapping.

## 14. Accessories

Two cross heads are supplied as standard with every unit. Additional accessories may be ordered, if required. Contact your Holmatro Dealer for details.

### Carrying handle

The Holmatro ram models 3322UL and 3332 comes with an optional carrying handle. If your fire department or rescue company desires, the handle can be installed with ease. To install the handle complete the following steps:

1. Attach the C-straps to the ram using the screws provided..
2. Position the handle to balance the tool.
3. Tighten the screws into the C-straps until they are snug. Be careful not to over tighten

## 15. Technical information

### Ram Models: 3321-UL, 3322-UL, 3331-UL & 3332

Made in the USA



The rams are not designed to be used as jacks and should never be used as such. Never work under a load lifted by the ram. To safely lift a load, you may use Holmatro's air lifting bag. Properly chock the load before lifting.

Qualified persons authorized by Holmatro may only make repairs and/or service to Holmatro® rescue tools. An active and presently authorized Holmatro dealer may only disassemble the sealed parts. Contact your dealer for further advice if other problems occur. In the event that you are unable to contact your dealer, contact Holmatro at:

**Holmatro, Inc.**  
505 McCormick Dr.  
Glen Burnie, MD 21061

Fax: (410) 768-4878  
Tel: (410) 768-9662  
E-mail: [info@holmatro-usa.com](mailto:info@holmatro-usa.com)  
Website: [www.holmatro-usa.com](http://www.holmatro-usa.com)



--	--

[illegible]

18